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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Shoji Shiba

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EXAMINER

EOFF, ANCA

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,218	Applicant(s) SHIBA ET AL.	
	Examiner ANCA EOFF	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The foreign priority document JP 2004-190479 filed on June 28, 2004 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.
2. Claims 1 and 5-19 are pending in the application. Claims 2-4 and 20-21 are canceled.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 5-12 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914).

With regard to claims 1 and 5-6, Kubota et al. disclose a photodegradable positive working resist having a carboxylic anhydride structure (par.0050), such as a methyl methacrylate / methacrylic acid / methacrylic anhydride copolymer (par.0085), wherein the methacrylic anhydride unit is equivalent to the unit of formula (2) of the instant application, wherein R₃ and R₄ are methyl groups.

Kubota et al. further disclose that during heating the layer of positive-working photosensitive material, a crosslinked material layer is formed (par.0016). During the

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exposure step, the irradiation with an ionizing radiation decomposes the crosslinked positive-working photosensitive material on a predetermined area of the crosslinked positive-working photosensitive material layer (par.0017). During development, the area irradiated by ionizing radiation is removed from the substrate, thereby obtaining a non-irradiated area as a desired pattern on a substrate (par.0018).

However, Kubota et al. fail to disclose that the positive-working photosensitive material comprises a compound that generates acid when irradiated with light, as required by the instant application.

Imai et al. disclose a positive working resin composition comprising a base polymer, an ether-bond-containing olefinic unsaturated compound as crosslinker and an acid-generating agent (abstract). Imai et al. further disclose that when a film formed from the above-mentioned composition is heated, the carboxyl groups of the base resin and the ether groups in the unsaturated compounds form crosslinks to make the film insoluble to a solvent or aqueous alkali solution (par.0097 and par.0110). Subsequently, by irradiating with an active energy beam and heating, an acid is generated, which acts as a catalyst to cleave the crosslink structure. Thus, the exposed part again becomes soluble to a solvent or aqueous alkali solution (par.0110).

Imai et al. further disclose that the acid generating agent acts as a catalyst for decomposing the crosslinked polymer film (par.0099).

Since the positive working resists of Kubota et al. and Imai et al. have a similar mode of operation (crosslinking during the pre-baking step and photodegradation/decomposition of the crosslinked polymer during the exposure step),

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it would have been obvious to one of ordinary skill in the art at the time to the invention to use the acid-generating agent of Imai et al. in the positive working composition of Kubota et al., in order to take advantage of the acid generator which acts as a catalyst for decomposing the crosslinked resist film (Imai et al., par.0099).

With regard to claim 7, Imai et al. disclose that the acid-generating agent may be a diaryliodonium or triarylsulfonium salt (par.0104).

With regard to claim 8, Kubota et al. disclose that on a substrate (201), a positive-working resist layer is coated and baked (par.0066 and fig. 1A). The positive-working resist layer is then irradiated with UV light through a mask (par.0066) and then is developed to form a mold pattern (3) (par.0068 and fig.1 B).

These steps are equivalent to the steps (1) and (2) and the mold pattern (3) is equivalent to the first pattern of the layer of the photosensitive resin composition of the instant application.

An anisotropic etching is performed from the rear surface of the silicon substrate to form a supply aperture (par.0072), which is equivalent with the "step of removing a part on the substrate" in step (3) of the instant application.

The mold pattern (3) formed by the positive-working resist is then irradiated by a ionizing radiation in order to decompose the crosslinked positive-working resist constituting the mold pattern (3) to a lower molecular weight, thereby enabling easy removal thereof (par.0074). These steps of irradiation and development are equivalent to the steps of exposure and development of the "second lithographic step" (step(3)) of the instant application.

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With regard to claim 9, Kubota et al. disclose that the exposure in the first lithographic step is performed in a region between 210 to 330 nm (par.0086) and the exposure in the second lithographic step is performed in a region between 210 to 330 nm (par.0096). The positive-working resist is decomposed at a wavelength of 270 nm or shorter (par.0085) so such a wavelength is preferred for the second lithographic step.

Based on the disclosure of Kubota et al. one of ordinary skill in the art at the time could experiment and perform the exposure in the first lithographic step at a wavelength longer than the wavelength of the exposure light in the second lithographic step. **For what reason**

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). (MPEP 2144.05)

With regard to claims 10-12, Kubota et al. further disclose that the developing liquid for the positive-working resist composition is a liquid containing a glycol ether having 6 or more carbon atoms, such as diethylene glycol monobutyl ether, a nitrogen-containing basic organic solvent, such as ethanolamine and morpholine and water (par.0062).

With regard to claim 15, Kubota et al. disclose that on a substrate (201), a positive-working resist layer is coated and baked (par.0066 and fig. 1A). The substrate

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is silicon and comprises a heat generating element thereon(par.0065)/discharge energy generating element. This step is equivalent to step (1) of the instant application.

The positive-working resist layer is then irradiated with UV light through a mask (par.0066) and then is developed to form a mold pattern (3) (par.0068 and fig.1 B). This is equivalent to the step (2) and the mold pattern (3) is equivalent to the first ink flow pattern of the instant application.

A negative-working material is coated on the mold pattern 3 to form a material layer for liquid flow path (4) (par.0069) then the negative-working material is subjected to pattern exposure to form an ink discharge port (par.0071).These steps are equivalent to the steps (4) and (5), where the negative-working material layer is equivalent to the coating resin layer of the instant application.

An anisotropic etching is performed from the rear surface of the silicon substrate to form a supply aperture (par.0072), which is equivalent with the “step of removing a part on the substrate” of step (3) of the instant application.

The mold pattern (3) formed by the positive-working resist is then irradiated by a ionizing radiation in order to decompose the crosslinked positive-working resist constituting the mold pattern (3) to a lower molecular weight, thereby enabling easy removal thereof (par.0074). These steps of irradiation and development are equivalent to the steps of exposure and development of the “second lithographic step” (step (3)) of the instant application.

With regard to claim 16, Kubota et al. disclose that the exposure in the first lithographic step is performed in a region between 210 to 330 nm (par.0086) and the

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exposure in the second lithographic step is performed in a region between 210 to 330 nm (par.0096). The positive-working resist is decomposed at a wavelength of 270 nm or shorter (par.0085) so such a wavelength is preferred for the second lithographic step.

Based on the disclosure of Kubota et al. one of ordinary skill in the art at the time could experiment and perform the exposure in the first lithographic step at a wavelength longer than the wavelength of the exposure light in the second lithographic step.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). (MPEP 2144.05)

With regard to claims 17-19, Kubota et al. further disclose that the developing liquid for the positive-working resist composition is a liquid containing a glycol ether having 6 or more carbon atoms, such as diethylene glycol monobutyl ether, a nitrogen-containing basic organic solvent, such as ethanolamine and morpholine and water (par.0062).

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914) and in further view of Ohkuma et al. (US Patent 6,455, 112).

With regard to claim 13, Kubota et al. disclose a photodegradable positive working resist having a carboxylic anhydride structure (par.0050), such as a methyl methacrylate / methacrylic acid / methacrylic anhydride copolymer (par.0085), wherein the methacrylic anhydride unit is equivalent to the unit of formula (2) of the instant application, wherein R_3 and R_4 are methyl groups.

Kubota et al. further disclose that during heating the layer of positive-working photosensitive material, a crosslinked material layer is formed (par.0016). During the exposure step, the irradiation with a ionizing radiation decomposes the crosslinked positive-working photosensitive material on a predetermined area of the crosslinked positive-working photosensitive material layer (par.0017). During development, the area irradiated by ionizing radiation is removed from the substrate, thereby obtaining a non-irradiated area as a desired pattern on a substrate (par.0018).

However, Kubota et al. fail to disclose that the positive-working photosensitive material comprises a compound that generates acid when irradiated with light, as required by the instant application.

Imai et al. disclose a positive working resin composition comprising a base polymer, an ether-bond-containing olefinic unsaturated compound as crosslinker and an acid-generating agent (abstract). Imai et al. further disclose that when a film formed from the above-mentioned composition is heated, the carboxyl groups of the base resin and the ether groups in the unsaturated compounds form crosslinks via addition reaction to make the film insoluble to a solvent or aqueous alkali solution (par.0097 and par.0110). Subsequently, by irradiating with an active energy beam and heating, an acid

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is generated, which acts as a catalyst to cleave the crosslink structure. Thus, the exposed part again becomes soluble to a solvent or aqueous alkali solution (par.0110).

Imai et al. further disclose that the acid generating agent acts as a catalyst for decomposing a crosslinked resist film (par.0099).

Since the positive working resists of Kubota et al. and Imai et al. have a similar mode of operation (crosslinking during the pre-baking step and photodegradation/cleavage of the crosslinked polymer during the exposure step), it would have been obvious to one of ordinary skill in the art at the time to the invention to use the acid-generating agent of Imai et al. in the positive working composition of Kubota et al., in order to take advantage of the acid generator which acts as a catalyst for decomposing the crosslinked resist film (Imai et al., par.0099).

The composition of Kubota et al. can be used of producing liquid discharge heads, fine structured members and hollow structured members (par.0033) but Kubota and Imai fail to disclose the method of claim 13 of the instant application.

Ohkuma et al. disclose a method of producing an ink jet head, said method comprising the following steps:

- providing on a substrate the desired number of ink ejection energy generating systems such as electrothermal converting elements or piezoelectric elements (column 8, lines 16-19), equivalent to the “pressure generating elements for discharging the ink” of the instant application (as defined in specification, page 27, lines 23-25);

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- applying a dissoluble resin on the substrate including the ink ejection energy generating elements, the dissoluble resin being a photosensitive material (column 8, lines 48-52), equivalent to step (1) of the instant application;

- patterning the dissoluble resist material layer to form the liquid flow path (column 9, lines 35-36), this patterning step being equivalent to the steps (2) and (3) of the instant application;

- forming a resin layer on the resist layer having the liquid flow path patterned (column 9, lines 35-36), this step being equivalent to the step (4) of forming an ink flow wall of the instant application;

- forming ink ejection outlets in the coating resin layer by use of oxygen plasma (column 10, lines 8-10), this step being equivalent to the step (5) of forming an ink discharge port of the instant application;

- dissolving the dissoluble resin forming the ink flow path pattern (column 10, lines 31-32), equivalent to step (6) of the instant application.

Based on Kubota's teachings that the composition may be used in methods of making liquid discharge heads, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the resist composition of Kubota modified by Imai as the dissoluble resin in the process of producing an inkjet head of Ohkuma et al., with a reasonable expectation of success.

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6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914) and in further view of Kubota et al. (US Pg-Pub 2004/0070643).

With regard to claim 14, Kubota et al. disclose a photodegradable positive working resist having a carboxylic anhydride structure (par.0050), such as a methyl methacrylate / methacrylic acid / methacrylic anhydride copolymer (par.0085), wherein the methacrylic anhydride unit is equivalent to the unit of formula (2) of the instant application, wherein R₃ and R₄ are methyl groups.

Kubota et al. further disclose that during heating the layer of positive-working photosensitive material, a crosslinked material layer is formed (par.0016). During the exposure step, the irradiation with an ionizing radiation decomposes the crosslinked positive-working photosensitive material on a predetermined area of the crosslinked positive-working photosensitive material layer (par.0017). During development, the area irradiated by ionizing radiation is removed from the substrate, thereby obtaining a non-irradiated area as a desired pattern on a substrate (par.0018).

However, Kubota et al. fail to disclose that the positive-working photosensitive material comprises a compound that generates acid when irradiated with light, as required by the instant application.

Imai et al. disclose a positive working resin composition comprising a base polymer, an ether-bond-containing olefinic unsaturated compound as crosslinker and an acid-generating agent (abstract). Imai et al. further disclose that when a film formed from the above-mentioned composition is heated, the carboxyl groups of the base resin and

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the ether groups in the unsaturated compounds form crosslinks via addition reaction to make the film insoluble to a solvent or aqueous alkali solution (par.0097 and par.0110). Subsequently, by irradiating with an active energy beam and heating, an acid is generated, which acts as a catalyst to cleave the crosslink structure. Thus, the exposed part again becomes soluble to a solvent or aqueous alkali solution (par.0110).

Imai et al. further disclose that the acid generating agent acts as a catalyst for decomposing a crosslinked resist film (par.0099).

Since the positive working resists of Kubota et al. and Imai et al. have a similar mode of operation (crosslinking during the pre-baking step and photodegradation/cleavage of the crosslinked polymer during the exposure step), it would have been obvious to one of ordinary skill in the art at the time to the invention to use the acid-generating agent of Imai et al. in the positive working composition of Kubota et al., in order to take advantage of the acid generator which acts as a catalyst for decomposing the crosslinked resist film (Imai et al., par.0099).

The composition of Kubota et al. can be used of producing liquid discharge heads, fine structured members and hollow structured members (par.0033) but Kubota and Imai fail to disclose the method of claim 14 of the instant application.

Kubota et al. (US Pg-Pub 2004/0070643) disclose a method of producing a liquid discharge head (abstract), said method comprising the following steps:

- providing a substrate (201) with a desired number of liquid discharge energy generating elements (202) , such as an electrothermal transducer or piezoelectric

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element, equivalent to the pressure generating elements for discharging ink of the instant application (par.0097, fig. 10);

- applying a crosslinking positive resist layer (203) on the substrate (201) including the liquid discharge energy generating elements (202) (par.0103, fig.11), equivalent to step (1) of the instant application;

- applying a positive resist layer (204) on the thermal crosslinking positive resist layer (203) (par.0105, fig. 12), equivalent to the step (2) of the instant application;

- exposing the resist layer (204) through a photomask (205) on which a desired pattern is drawn (par.0106, fig. 13), equivalent to step (3) of the instant application;

- developing the positive resist layer (204) for pattern forming (par.0107, fig. 14), equivalent to step (4) of the instant application;

- subjecting the lower layer of resist (203) to patterning (exposure and development) (par.0108 and fig.15), equivalent to steps (5) and (6) of the instant application;

- coating a layer of a liquid channel structure material (207) on the patterned lower layer (203) and the upper layer (204), equivalent to step (7) of the instant application where the liquid channel structure material of Kubota et al. is equivalent to coating resin layer of the instant application;

- forming ink discharge ports (209) in the liquid channel structure material (207) (par.0111), equivalent to step (8) of the instant application ;

- radiating the liquid channel structure material (207) with a ionizing radiation and immersing the substrate (201) in developer to remove the mold resist (par.0114, fig.18), equivalent to the step (9) of the instant application.

Based on Kubota's teachings that the composition may be used in methods of making liquid discharge heads, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the resist composition of Kubota modified by Imai as crosslinking positive resin for the layer (203) in the process of producing an inkjet head of Kubota et al., with a reasonable expectation of success.

Response to Arguments

7. The rejection of claims 1-3 and 7 under 35 USC 102(b) over Van Damme et al. (EP 0 819 986) is withdrawn following the applicant's amendment to claim 1.

The rejection of claim 20 under 35 USC 102(b)/103(a) over Ohkuma et al. (US Patent 6,455,112) and the rejection of claim 21 under 35 USC 103(a) over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914) and in further view of Ohkuma et al. (US Patent 6,455,112) are withdrawn following the cancellation of claims 20 and 21

8. Applicant's arguments filed on July 09, 2008, with regard to the rejection of claims 1-12 and 15-19 under 35 USC 103(a) over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914), the rejection of claim 13 under 35 USC 103 (a) over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914) and in further view of Ohkuma et al. (US Patent

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6,455,112), the rejection of claim 14 under 35 USC 103(a) over Kubota et al. (US Pg-Pub 2004/0072107) in view of Imai et al. (US Pg-Pub 2004/0081914) and in further view of Kubota et al. (US Pg-Pub 2004/0070643) have been fully considered but they are not persuasive.

On pages 15-16 of the Remarks, the applicant shows that Imai et al. disclose a photosensitive resin composition comprising a base polymer, an ether bond-containing unsaturated olefine and an acid generating agent. The applicant further argues that the carboxyl groups in the base polymer and the ether groups in the unsaturated compound form a crosslinked structure. Later, by irradiating and heating, the acid generating agent generates an acid which cleaves the crosslinked structure.

The applicant then argues that the polymer of the instant application is different from the polymer of Imai et al and that the acid generating agent of Imai et al. cleaves a different crosslinked compound than in the present application.

The examiner would like to show that, as presented in paragraph 7 of the previous Office Action, Kubota et al. disclose a positive resist composition comprising a methyl methacrylate/methacrylic acid/methacrylic anhydride copolymer (par.0085).

Kubota et al. further disclose that the positive-working material is heated and a crosslinked material is formed (par.0016). During the exposure step, the irradiation with a ionizing radiation decomposes the crosslinked material (par.0017) and, during development, the area irradiated by ionizing radiation is removed from the substrate (par.0018).

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Imai et al. disclose a positive working resin composition comprising a base polymer, an ether bond-containing olefinic unsaturated compound as crosslinker and an acid generating agent (abstract). Imai et al. further disclose that a crosslinked film is formed during heating (par.0097, par.0110) and by irradiating with an active energy beam and heating, an acid is generated by the acid generating agent and this acid acts as catalyst to cleave the crosslinked structure (par.0110).

Imai et al. clearly disclose that the acid generating agent acts as a catalyst for decomposing the crosslinked resist film (par.0099).

While the examiner agrees that the positive-working resist compositions of Kubota et al. and Imai et al. do not comprise similar compounds, the examiner would like to emphasize the similarity of the mode of operations of the two positive-working resist compositions (crosslinking during the pre-baking step and photodegradation /decomposition of the crosslinked polymer during the exposure step).

Due to this similarity and to the teaching of Imai et al. that an acid generating agent acts as a catalyst for decomposing the crosslinked resist film (par.0099), it would have been obvious to one of ordinary skill in the art at the time of the invention to use the acid-generating agent of Imai et al. in the positive-working resist composition of Kubota et al, in order to take advantage of the acid generator acting as catalyst for the photodegradation /decomposition of a crosslinked resist film.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anca Eoff whose telephone number is 571-272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795